NEWSLINE

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Bookless heads SEP Directorate

Director Michael Anastasio has named Bill Bookless the new associate director for the Safety & Environmental Protection Directorate. Bookless, currently the deputy associate director for Defense & Nuclear Technologies, replaces Den Fisher, who retired in June.

FRANK NUNEZ/NEWSLINE

Bill Bookless, AD for Safety and Environmental Protection

Anastasio introduced Bookless to SEP employees Monday during a special all-hands meeting. "I look forward to having Bill on my management team," Anastasio said. "Bill has an extensive background including nuclear safety and security. With his leadership experience, he will continue to ensure that the Laboratory maintains a safety and environmental protection program that is best in class."

Bookless, whose appointment is effective immediately, will be responsible for providing the Laboratory with leadership, cost-effective services and support in environmental, safety and health activities and quality assurance. He will be responsible for executing direct-funded Department of Energy Environmental Management program activities in waste management and environmental restoration. Key goals of Bookless' directorate include fostering a safe working environment across the Laboratory, with appropriate safety training and education for all Lab employees, protecting the

See **BOOKLESS,** *page 7*

Direct carbon conversion holds promise of cleaner fossil fuel combustion

By Charles Osolin
NEWSLINE STAFF WRITER

What if we could nearly double the amount of electric energy we could produce from a ton of coal — and do it in a way that largely avoids the air pollution and climate change problems associated with fossil fuel combustion?

Direct carbon conversion, an advanced energy technology now being tested at the Laboratory, holds promise of doing just that. If proven successful and adopted on a large scale, the process could conserve precious fossil resources by allowing more power to be har-

See **CARBON,** *page 7*

Commute alternatives offered for Greenville Road closure

By Anne M. Stark
NEWSLINE STAFF WRITER

Greenville Road will close as soon as next week to make way for the City of Livermore Greenville Road widening and Union Pacific Railroad bridge replacement construction project.

Greenville Road, south of the National Drive intersection and north of the Marathon Drive inter-

See **GREENVILLE,** *page 5*

Traffic Safety Month focuses on the everyday hazards of getting around the Laboratory

August has been designated "Traffic Safety Month" at the Lab, according to Dennis Barrett, chair of the Lab's Traffic Safety Committee.

Posters and banners posted earlier this month, and free training offered to all employees, call attention to traffic safety and emphasize each person's responsibility for protecting themselves.

Despite on-site dealings with hazardous materials or other unique site issues, riding bikes, walking and driving motor vehicles remain "one of the most dangerous things that we do" at the Lab, Barrett said.

Barrett points out that employees face traffic hazards everywhere and shouldn't feel safe just because they are on site. At the main site, which is like a small city, there are approxi-

TRAFFIC, *page 5*

Menu of services in South Café to change

By Don Johnston
NEWSLINE STAFF WRITER

The South Café will remodel and convert to "grab and go" food service effective Monday, Oct. 4.

To prepare for the transition, the South Café will be closed Friday, Oct. 1, and reopen the following Monday.

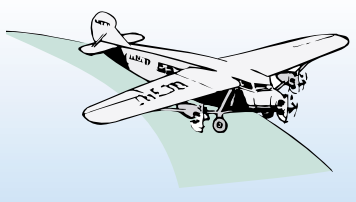
"This is the option that makes the most business sense while continuing to provide Laboratory employees with a full range of food service options at a reasonable price," said Michelle Quick, leader of the Food Services Group in the Business Services Department.

Java Wave, the popular coffee bar, will continue coffee and beverage services from 7 a.m. to 2:30 p.m.

See **CAFE,** *page 3*

JACQUELINE MCBRIDE/NEWSLINE

Java Wave will continue specialty coffee services in the South Café.



Air museum takes wing

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Waste management award

— Page 5

A Wild Side burning issue

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LAB COMMUNITY NEWS

Weekly Calendar

Technical Meeting Calendar, page 4

Tuesday 24

The **Lab's Microcentury Toastmasters club** will hold its annual humorous speech and evaluation contests today at noon in the Bldg. 155 auditorium. All employees are welcome to attend.

For more information about Toastmasters, contact Don Johnston, 3-4902, johnston19, or Cindy Conrado, 2-0907, conrado1.

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A **Fidelity retirement counselor** will be available today and Sept. 9 to assist with: assessing the current state of retirement accounts, learning how to diversify, planning asset allocation and identifying income strategies. Fidelity Investments Mutual Funds are available to UC's workplace retirement plan participants in addition to the UC-managed investments pools. If you would like to set up a consultation with a Fidelity representative, call 800-642-7131. When calling, be sure to specify that you are an LLNL employee.

UP & COMING

The **2004 CalPERS Long-Term Care** application period ends Aug. 31. Long-term care provides the extended care you would need when, because of a chronic illness, injury, or old age you need help with basic activities like dressing, bathing or eating. Long-term care is not generally covered by health insurance, disability insurance or Medicare. The program is available to all California public employees and retirees, including University of California employees and their family members. An informational video and application kits regarding the CalPERS Long-Term Care Program are available in the Benefits Office, Bldg. 571, room 1205. For additional information, visit the Benefits Website at www.llnl.gov/llnl/02employment/benefits/benefits.htm or call 2-9955.

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Space is available for the two-day **Comprehensive Retirement Planning Workshop**, Sept. 1-2, in the Bldg. 123 auditorium. This workshop, offered by the Benefits Office, is designed especially for those within 10 years of retirement. To register online, go to the Website at http://www.llnl.gov/llnl/02employment/benefits/benefits.htm. The cost for the workshop is $95. Employees may register their spouse to accompany them at no additional cost by calling the Benefits Office, 2-9957.

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End your summer with a big splash at **LLESA's Family Day Picnic** at Paramount's Great America on Saturday, Sept.18. Park hours are 10 a.m.-7 p.m. Ticket price is $27 for all ages and includes park admission and an all-you-can-eat hot dog, barbecue beans, potato salad and watermelon lunch from noon-1:30 p.m. at the County Fair Picnic Grove. Parking tickets for picnic attendees are also available at the Time Zone and sell for $5 per vehicle. Picnic and parking tickets must be purchased by Friday, Sept.17, in the Time Zone, Trailer 4128. The Time Zone is open Monday through Friday, 7:30 a.m.-3 p.m.

ACS features Lab accelerator research

By Anne M. Stark
NEWSLINE STAFF WRITER

DNA damage formed during carcinogenesis is just one of the topics Laboratory researchers will discuss during the 228th National Meeting of the American Chemical Society in Philadelphia.

Paul Henderson of the Biology and Biotechnology Research Program (BBRP) will host a mini symposium titled "Emerging Applications of Accelerator Mass Spectrometry to Toxicology and Pharmacokinetics" on the biological applications of accelerator mass spectrometry (AMS).

Karen Dingley of BBRP will present the use of AMS to detect carcinogens, called heterocyclic amines, formed during the cooking of meat and research on the prevention of cancer due to those chemicals. Her talk also will be included in Henderson's mini symposium.

Other presentations during the session include using AMS to study new potential biomarkers for atherosclerosis, DNA oxidation in breast cancer cells, pharmacokinetics and development of novel drug delivery devices.

Henderson will present an overview of AMS applications in biological research and the use of AMS to detect a new type of DNA damage in breast cancer cells.

Charles Westbrook of the Chemistry and Materials Science (CMS) Directorate will discuss "Kinetic Modeling of Soot Production in Combustion of Munitions."

Destroying outdated munitions is typically done by either burning or detonations in an open environment. Soot production during this destruction has become a serious problem for environmental reasons. Westbrook and colleague William Pitz have used kinetic modeling to observe the soot production chemistry involved.

The chemical kinetic models used in studying soot production during munitions destruction were originally developed in Livermore's studies on soot production in diesel engines. LLNL's contributions to national energy and environmental programs are closely coupled to its Department of Defense munitions lifetime project.

Westbrook and Pitz compared two different high explosive materials, TNT and RDX, and will present their results at the meeting.

Other sessions by LLNL researchers include:

• "Defining Protein Signatures: Quantification of Protein Expression in Serum Using LC-MS," by Sharon Shields of CMS.

• "Simulation of Water in Giant Planets," by Nir Goldman of CMS.

• "Mechanism of DNA Compaction by Abf2p Studied by Atomic Force Microscopy and Optical Tweezers," by Raymond Friddle.

• "Properties of the Liquid/Vapor Interfaces of Water and Methanol: A Comparison of Fixed-Charge, Polarizable and ab initio Models," by I Feng W. Kuo of CMS.

Other LLNL researchers will be presenting posters:

• "Prefractionation and Digestion of Human Blood for Proteomic Analysis by Mass Spectrometry," by Michel Corzett of BBRP.

• "Accelerator Mass Spectrometry for Ultrasensitive Quantification of Modified Tyrosine Residues Following Selective Introduction of 14C-Labled Compounds into Peptides," by Sang Soo Hah of BBRP.

The ACS National Exposition will be held Aug. 22-25 in the Pennsylvania Convention Center.

The American Chemical Society is a self-governed individual membership organization that consists of more than 159,000 members at all degree levels and in all fields of chemistry. The organization provides a broad range of opportunities for peer interaction and career development, regardless of professional or scientific interests.

For more information, see the Web at http://pubs3.acs.org/philadelphia04/.

Stepping Out for Cancer Kures hosts fund-raiser

The Tri-Valley chapter of S.O.C.K.s (Stepping Out for Cancer Kures) is holding its annual fund-raising pasta feed, raffle, and auction Friday, Aug. 27, at the Veteran's Hall in downtown Pleasanton.

Members will be selling tickets at the Lab's South Café on Tuesday, Aug. 24, from 11:30 a.m.-1 p.m.

Their goal is to raise money for the Breast Cancer 3-Day walk that benefits the Susan G. Komen Breast Cancer Foundation.

The S.O.C.K.s team includes almost a dozen Lab employees who are training to walk with thousands of other individuals participating in the Breast Cancer 3-Day Walk, Oct. 15-17 in San Francisco. They will walk 60 miles to raise money that benefits the Susan G. Komen Breast Cancer Foundation, which funds breast cancer research, education, screening and treatment programs, as well as the National Philanthropic Trust.

The Komen Foundation fulfills its mission through support of innovative research grants as well as educational, scientific and community outreach programs around the world. It remains the largest private source of funding for breast cancer research and community outreach programs.

In America, a new case of breast cancer is diagnosed every three minutes and every thirteen minutes, the disease claims another life. Breast cancer is the most common cancer diagnosed in the San Francisco Bay Area.

Support your co-workers by buying raffle tickets and attending the pasta feed on Friday, Aug. 27. For more information, contact Cheryl Hernandez, 2-1300.

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Mona Lisa logo to retire

Mona LLESA is going to retire. Submit the winning design for a new logo to represent the Livermore Laboratory Employee Services Association (LLESA) and you'll win a mini iPod. A contest entry form can be found on the LLESA Web page at http://llesa.llnl.gov/ under the paint palette titled LLESA Logo Contest or at the LLESA Office, Bldg. 415, room 142. Contest entries must be received in the LLESA Office by 4:30 p.m. on Friday, Sept. 10.

Newsline

Newsline is published weekly by the Internal Communications Department, Public Affairs Office, Lawrence Livermore National Laboratory (LLNL), for Laboratory employees and retirees.

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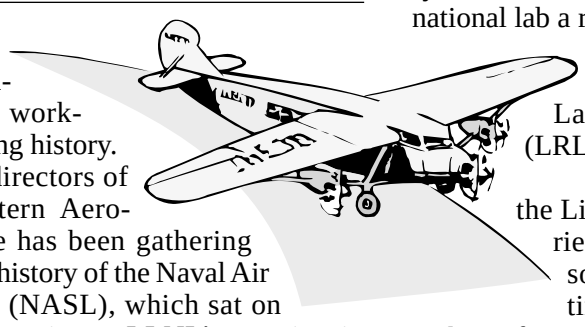
AROUND THE LAB

Witnesses sought for Livermore Naval Air Station history

By Leslie Schwartz
NEWSLINE STAFF WRITER



Lab retiree and airplane enthusiast Don Ryder is working on reconstructing history.

As one of 24 directors of the Oakland Western Aerospace Museum, he has been gathering information on the history of the Naval Air Station Livermore (NASL), which sat on the Laboratory site prior to LLNL's opening in 1952.

The federal government constructed a naval air station to be used as a training ground in the middle of empty fields in the Livermore Valley in 1942 just after the attack on Pearl Harbor. More than 4,000 pilots were trained during the two years the base was in operation. It eventually closed in 1946 after World War II ended.

Alameda County took possession of the land in 1947, using it for Livermore schools. But by 1952, plans for building an atomic particle accelerator already were underway. Edward Teller and Ernest O. Lawrence, co-founders of the Laboratory, worked together to make their vision of a national lab a reality. The University of California Radiation Laboratory opened later that year and was renamed Lawrence Radiation Laboratory (LRL) upon Lawrence's death.

The rich and complex history of the Livermore Lab site is filled with stories and memories that provide a personal perspective to this historical timeline. Museum officials hope to gather information about the naval base, including some of the human-interest stories that exist behind the factual history, to be used for educational purposes.

"There were so many people and so much activity at the site during those critical years that it would be a shame not to illuminate, preserve and present this important research material which will eventually be in place to educate others about the aviation activities and history of NASL," Ryder said.

"We're looking for people who have some kind of collective memory of life at Naval Air Station Livermore from 1941 to 1945," Ryder said.

"We're hoping there are some people who worked at the naval air station who might still be working, consulting or who are retired from the Lab. We're quite fortunate to have learned a great deal about the naval facility from the very helpful technical experts at the LLNL archives."

If you are an employee, consultant, retiree or family member and could help contribute to this project, contact Ryder at dryder24@comcast.net or (925) 337-2260.

The Oakland Western Aerospace Museum is located at 8260 Boeing Street at the former Oakland Airport (directly across from Alaska Airlines), and features aviation history of the Bay Area and West Coast. The museum hosts more than 24,000 square feet of indoor displays, showing 13 vintage/classic planes, including the Amelia Earhart sister-ship, with eight individual rooms showcasing individual aviation subjects. An additional 34,000 square feet of outdoor displays features a U.S. Navy F-14 TOMCAT, a Soviet MiG 15, a Harrier Jump Jet, as well as seven other jets, and a four-engine seaplane. For additional museum information, go to http://www.westernaerospace-museum.org/.

CAFE

Continued from page 1

in the South Café and will anchor a continental breakfast and lunchtime "grab and go" sandwich and salad area. The West and Central cafes will continue full service operations with West getting a new Java Wave coffee bar in early October.

Quick said factors that prompted the change include: a decline in the number of customers since Sept. 11, 2001 and the conversion of East Avenue to limited access; a low population in the area; a shortage of parking space near the café; the popularity of the new Central Café and a growing number of off-site dining options.

The number of South Café customers declined from 800 per day in 2000 to 600 per day in 2003. About 40 percent of current customers are Sandia employees.

Patronage of the West Café has held steady at 650 customers per day and is increasing weekly at the new Central Café, which currently serves more than 800 customers a day.

"Operating three full service cafes on a one square mile site is no longer financially viable," Quick said.

Quick said Eurest will focus on devoting more resources to meet the greater demand in each café and ensure a speedy checkout.

Before making the decision to reduce service in the South Café, Business Services touched base with the impacted organizations in the South Mall area, Lab Site Office, and Sandia.

Dominic Carano, owner and manager of Java Wave, said the South Café remains a favorite morning gathering place for coffee and that an expanded pastry selection will be offered during breakfast hours. Eurest subcontracts specialty coffee service to Java Wave in the South and Central cafes.

"The South Café is where we started coffee services at the Lab nearly 10 years ago and we have developed a loyal clientele," Carano said. "We'll remain in business here as long as people keep coming."

BRIEFLY

Parcourse replacement project begins

The Laboratory will be removing the 20-year-old parcourse exercise stations located around the perimeter of Inner Loop Road and installing new parcourse stations with modernized equipment at eight locations around the perimeter of the Drainage Retention Basin. Construction of the new stations will begin Sept. 1, and will be completed by approximately Sept. 30. Removal of the existing parcourse stations will begin Saturday, Sept. 4, and be completed by approximately Sept. 10. Direct any questions to Len Freitas, project manager, at 2-0690.

UC Olympic games Website

A "UC at the Olympics" Website has been established to highlight the participation of UC students, alumni and coaches at the Athens Summer Olympic Games. The Website can be found at http://www.universityofcalifornia.edu/news/summerolympics2004.html

The University of California will be sending more athletes to the 2004 Olympic games than many countries. Historically, participants with UC connections have performed well in these international competitions — winning nearly three dozen medals at the last summer games in Sydney. In fact, if UC were a country, its 2000 medal total would have been exceeded by only six other nations.

LBNL to host NIH grant workshop

Lawrence Berkeley National Laboratory will host a workshop on applying for National Institutes of Health grants from 8 a.m. to 3 p.m. Thursday, Sept. 9, in LBNL's Bldg. 50 auditorium, Berkeley.

This workshop is designed for principal investigators (PIs), hopeful PIs, postdoctoral fellows, graduate students and their support staff. Anthony Coelho, the review policy officer for the National Institutes of Health, will walk participants through the steps from grant application development to peer review and the funding decisions. By the end of the day, participants will have insight into how to write grant applications that succeed in winning research funding. For more information or to register, check the Web: http://www.lbl.gov/msd/proposal_workshop/

Construction activities

A portion of LLNL's A-1 parking lot is restricted to parking due to construction activities for Sandia National Laboratory's (SNL's) Sanitary Sewer Line Relocation Project. Approximately 13 parking stalls are temporarily closed in the southeast corner of the parking lot to accommodate construction stand-off distance. The parking lot is expected to be fully reopened by Sept. 1. Employees who normally park in this area during this time are asked to park in adjacent areas of the A-1 lot.

Beginning Monday, Aug. 30, construction will expand to West Perimeter Drive at LLNL's southwest entrance. Traffic onto West Perimeter Drive from East Avenue will be restricted to a single, one-way-only northbound traffic lane and the southbound gate at post P-SW, Southwest Security Post, will be temporarily closed to all thru-traffic. All vehicle and bicycle traffic normally exiting the Lab southbound on West Perimeter Drive through the Southwest Security Post should exit to the north, via West Perimeter Drive to Mesquite Way to South Vasco Road. Employees are asked to follow the detour signs posted by the subcontractor. This phase of the construction is expected to be completed and traffic on West Perimeter Drive restored to its normal north/south use on Sept. 10.

All questions should be directed to Anne Yang of SNL at 294-1210.

NEWS YOU CAN USE

Upgrades enhance Lab's UniCard credit card program

Tammy Gibbs
LINCS PROJECT MANAGER

With UniCard migration coming in October, Procurement & Materiel is fielding questions about its effect on procurement and property business rules and the continued integrity of the UniCard system in an online environment.

"UniCard Migration" is the transition to the next phase of Procurement & Materiel's (P&M) Laboratory Integrated Network for Contracts and Supply (LINCS) project to upgrade the Lab's Electronic Ordering System (EOS). See the Aug. 6 edition of *Newsline* for more background information.

While UniCard migration will significantly change the credit card ordering process, the underlying business rules will see few, if any, changes. Moreover, UniCard migration will enhance the integrity of the UniCard program through greater visibility of and control over credit card transactions.

Business rules will continue to apply after UniCard migration. The UniCard may not be used to purchase attractive equipment (portable items with a value of $300 or more) or controlled equipment (items with a value of $5,000 or more). For more information about attractive and controlled equipment, visit the Property Management Website at http://www-r.llnl.gov/ibis/property/property.html.

UniCard migration will automate the approval process for controlled items and services. Currently, technical release representatives (TRRs) must obtain approval for controlled items and services manually before they make their credit card purchase. After UniCard migration, TRRs will create a request in EOS and identify any controlled items or services they intend to purchase. EOS will route this request for electronic approval just as P&M's On-Line Requisition (OLR) system does for standard requisitions. The complete list of controlled items and services may be viewed at http://www-r.llnl.gov/pm/trr/html/controlitem.html.

UniCard migration also will result in tighter integration between EOS and ChemTrack for chemical purchases. The October rollout will introduce a checkbox at order line entry to identify the item as a chemical. When checked, EOS will present a ChemTrak form for the TRR to fill out and provide to the ChemTrack organization.

UniCard migration will improve P&M's self-assessment and oversight of the credit card program. TRRs will make their purchases through EOS rather than by telephone or facsimile as they do today and provide line item detail for each item ordered. P&M's self-assessment review team will use data mining techniques to ensure that business rules are being followed. This will make an oversight process that is currently very good into one that is outstanding.

More effective self-assessment, combined with the existing active account approval process and directorate-level controls through the directorate administrator tool, will maintain the integrity of the UniCard program.

P&M will publish additional articles between now and the rollout to provide more details about UniCard migration. Contact P&M Customer Support at 3-3448 or pcs@llnl.gov for answers to questions about using EOS. For more complete information or to see previous articles, go to http://www-r.llnl.gov/pm/lincs/news/.

Summer Student Calendar

Don't miss out on the last events for summer scholars coming up this week. These tours, panels and seminars will help you end your internship with more knowledge, as well as networking skills.

Visit the Student Bulletin Board at http://education.llnl.gov/sbb/ for more information or to register for events online.

Tuesday 24

Engineering Lecture
Daniel White, leader of the Computational Engineering Group in EE/DSED, presents "Computational Engineering at LLNL." The seminar features a brief overview of past, present and future LLNL supercomputers and a few specific engineering simulation codes and applications of these codes to engineering design and analysis problems. 9:30-10:30 a.m., Bldg. 155 auditorium. Contact: Gay Spivey, 2-8897.

Wednesday 25

Internships in Computational Modeling at the Terascale (ICMT)
Come hear Rob Falgout from the Center for Applied Scientific Computing talk about "Scalable Linear Solvers: Multigrid Methods" in Bldg. 219, room 163 from 1:30–3 p.m. Contact: Paula Ashley, 3-3691, or Rob Falgout, 2-4377.

Technical Meeting Calendar

Friday 20

PHYSICS & ADVANCED TECHNOLOGIES/ ELECTRONICS ENGINEERING TECHNOLOGIES
"A New Foundation for Public Key Cryptography," by Anna Johnston. 10-11 a.m., Bldg. 141, room 1104 (Nyquist Room). Contact: Becka Gordon, 2-2199.

Tuesday 24

RADIATION DETECTION CENTER
"High Sensitivity Gamma-Ray Imaging Using Position-Sensitive Semiconductor Detectors," by Jim Kurfess, Naval Research Laboratory. 11 a.m., Bldg. 151, room 1209 (uncleared area). Contact: Ron Wurtz, 3-8504, or Christie Shannon, 3-6683.

Wednesday 25

INTEGRATED COMPUTING & COMMUNICATIONS DEPARTMENT
"HP Technology Product Roadshow," by Holman's and HP customer service representatives. 8-11 a.m., West Cafeteria. For more information, go to www.holmans.com/qse. Contact: Mary Ann Chapeta, 4-4103.

H-DIVISION
"Non-Resonant X-ray Raman Scattering — A Powerful New Tool to Study Low Z Materials in Ambient and Extreme Conditions," by Uwe Bergmann, Stanford Synchrotron Radiation Laboratory. 2 p.m., Bldg. 319, room 205. Contact: William Evans, 4-3356, or Wendy Dossey, 3-5556.

Thursday 26

CHEMISTRY & MATERIALS SCIENCE DIRECTORATE/ CHEMICAL BIOLOGY & NUCLEAR SCIENCE
"Investigation of the Structures of Exotic Neutron-Rich and Proton-Rich Isotopes," by Jason Shergur, Department of Chemistry, University of Maryland and Physics Division, Argonne National Laboratory, Argonne. 10 a.m., Bldg. 155 auditorium. Contact: Mark Stoye, 3-3079, or Dawn Brosnan, 4-5008.

Sept. 13

BIOSECURITY & NANOSCIENCES LABORATORY
"A Nanoengineering Approach to Investigate Polyvalent Biochemical Interactions," by Gangyu Liu, Department of Chemistry, UC Davis. 2 p.m., Bldg. 151, room 1209 (Stevenson Room). Contact: Katie Thomas, 2-7903.

Sept. 20

BIOSECURITY & NANOSCIENCES LABORATORY
"Conductance Imaging AFM and the Electronic Properties of Carbon Nanotubes," by Michael Stadermann, research assistant University of North Carolina at Chapel Hill. 2 p.m., Bldg. 151, room 1209 (Stevenson Room). Contact: Katie Thomas, 2-7903.

The deadline for the next Technical Meeting Calendar is noon, Wednesday.

NEWS OF NOTE

Lab's Wolf honored for hazardous materials work

Laboratory employee John Wolf received one of the top awards at the national meeting of the Academy of Certified Hazardous Materials Managers (ACHMM) in Las Vegas, Nev. earlier this month.

Wolf is a radiological characterization analyst in the Radioactive and Hazardous Waste Management Division of LLNL where he supports the characterization and disposition of legacy low level radioactive waste.

Wolf received "Young CHMM of the Year Award," one of the top four honors bestowed on Certified Hazardous Materials Managers (CHMM). He earned this top award for his outstanding contributions and significant accomplishments in the hazardous materials management, environmental, and health and safety fields. This award was given to reward Wolf as the brightest and best of young (35 years or younger) CHMM professionals.

In addition, Wolf received a "Champion of Excellence Award" for his promotion of the CHMM credential and professional development activities as president of the Northern California chapter.

John Wolf

ACHMM is a professional society for certified hazardous materials managers and environmental, health, safety and waste management professionals. This is a national organization with more than 6,000 certified professionals actively supporting a variety of environmental and waste management programs, projects and activities in the United States.

GREENVILLE

Continued from page 1

section, will be closed for approximately 10 months.

The Livermore City Council awarded the construction contract to Bay Cities Paving & Grading Inc. on July 26. City officials met with the contractor Tuesday and will issue a Notice to Proceed (NTP) on Monday, Aug.23. However, the only work that will begin immediately will be the installation of silt fencing at the project site, which will not require the road to be closed. A firm closure date has not yet been set.

ACE train schedules will not be affected during the construction.

The city's designated detour route around the immediate construction area recommends drivers exiting I-580 at Greenville, turn south/right on Las Positas Road, left on Vasco Road, left on Patterson Pass Road and right on Greenville Road.

However, to minimize traffic delays caused by construction detours on Greenville Road, the Lab's Traffic Safety Committee recommends employees choose alternate commute routes and allow 20–30 minutes additional commute time to get to and from LLNL during construction. Several suggestions for alternate commute routes follow:

• Eastbound on I-580 — Exit First Street, continue southbound on First, then left on Mines Road, left on Patterson Pass Road, right on Greenville Road.

The city of Livermore's designated detour routes recommend commuters use Las Positas and Brisa streets to avoid the construction.

• Eastbound on I-580 — Exit First Street, continue southbound on First, then left on Mines Road, left on Patterson Pass Road, right on South Vasco Road.

• Eastbound on I-580 — Exit First Street, continue southbound on First, then left on Mines Road, left on East Avenue.

• Eastbound on I-580 — Exit North Livermore, continue southbound on North Livermore, then left on First Street, right on Mines Road, left on Patterson Pass Road, right on Greenville Road.

• Eastbound on I-580 — Exit North Livermore, continue southbound on North Livermore, then left on First Street, right on Mines Road, left on Patterson Pass Road, right on South Vasco Road.

• Eastbound on I-580 — Exit North Livermore, continue southbound on North Livermore, then left on East Avenue.

• Westbound on I-580 — Exit Greenville Road, turn left on Northfront Road, continue to North Vasco Road, left on North Vasco Road and over the freeway.

• Westbound on I-580 — Exit Grant Line Road (north/right), left on Altamont Pass Road, continue past Greenville Road intersection, and continue west on Northfront Road (Altamont becomes Northfront) to North Vasco Road, then left on North Vasco Road and over the freeway.

Laboratory mailers will be sent out once the closure date is set with details and alternate commuter routes. Details also will appear in future editions of *Newsline* and *NewsOnLine*.

The City of Livermore Website shows a photo and details of the project, and will post progress reports at http://www.ci.livermore.ca.us/eng/roadwork.html#greenville.

TRAFFIC

Continued from page 1

mately 7,000 private vehicles onsite everyday, plus 1,000 government vehicles, 700 LLNL owned bicycles, forklifts, and large commercial motor vehicles, all moving about on multiple roadways. Plus, Site 300 has its own unique traffic issues with hilly terrain and many steep and winding roads and frequent onsite transportation of explosives.

In addition, Barrett said. Laboratory employees face daily risks offsite. Vehicle traffic and accidents over the Altamont Pass and back road routes have increased as people flock to more affordable homes in the Central Valley.

According to statistics maintained by the California Highway Patrol, traffic accidents and fatalities increase during the summer months, with August having the highest incidence rate. "That's one reason we chose August to highlight traffic safety," Barrett said. "It's a good time to remind people to be extra alert and that they can make a difference when it comes to traffic safety."

Barrett stressed that while his committee focuses on traffic safety, it does not make people safer. "It's really the responsibility of every employee, and lies at the very heart of ISM (Integrated Safety Management)."

Barrett made two specific suggestions to benefit all who drive, bike or walk at the Lab. "We offer a free bicycle safety course, as well a free defensive driving course. Employees who complete both of these courses can truly say they've done something to make the Lab a safer place to work, and may make their own commute safer."

The Bicycle Safety course (HS5420-W) is Web-based and takes about 20 minutes to complete. It covers lessons learned regarding bike accidents, how to do a quick safety check on a Lab bike and more. The course can be found at www-hctrain.llnl.gov/SET/HS5420/BSO1.html.

Defensive Driving (HS5600-CBT) is a computer-based course that is taken at the Hazards Control Training Center. It takes about one hour to complete and covers: what is defensive driving; defensive driving techniques; how to avoid collisions; highway and urban driving; and defensive driving attitudes. Contact Debbie Fernandez at 3-1094 to schedule an appointment.

"If employees haven't already done so, August would be an ideal time to take these courses," Barrett said. "I can't stress our message too much: Traffic safety is everyone's responsibility. We take it for granted our commutes are safe and that moving around the site is safe. But they can be among the most dangerous things we do."

CLASSIFIED ADS

See complete classified ad listings at https://www-ais.llnl.gov/newsline/ads/

AUTOMOBILES

1985 Cadillac DeVille, Clean Lt Blue, Runs But engine needs work. $299 or Donate to charity. 925-513-7416

2000 - Porsche Boxster excellent condition. White w/blk conv, grey int, 5-spd, power windows, doors, locks, alarm, AM/FM CD, 50K miles. $26K/obo 925-997-0011

2002 - BMW 330i, fully upgraded with sport and premium packages, moon roof, leather, metallic silver, xlnt condition, garaged, 39k miles, asking $29.8K 925-447-6707

1993 - Plymouth Grand Voyager, SE, 3.2 V6, Quad seating, PW, PL, Power driver seat, Rear AC, only 76K miles, Good Condition, $3500/OBO 925-447-2697

1996 - T-Bird,smogged, loaded,103K.CC,AT,PW ,PDB, TW,AM FM/CD,pwrdrlocks,TW ,4.6 V-8,power mirrors,rear window defogger,deluxe wheels, remote trunk $2700.00 209-823-4670

1980 - Mercedes Benz 450SL w/ hard top and new rag top 69,000 miles Second owner $15,500 925-449-4624

2001 - Volkswagen Jetta, Wolfsburg Edition, white, excellent condition, sunroof,turbo, 5-speed, power windows, cruise, 40k mi, $12,900 or BO. 209-545-1308

1999 - Corvette Coupe, Black + Black, all options, Hud-Auto-Traction Control, 10 disc CD changer, 22K miles, $27,500 925-292-0454

2000 - Toyota Camry CE 4D Sedan,silver,perfect condition, 4cyl., 2.2L, loaded,70K miles, Auto-trans,alloy rims,CD,tinted windows,$8,900 925-736-7507

1989 - ACURA LEGEND-Runs/looks GREAT! $2,750obo Loaded with power options, 5-SPEED, 186K hwy miles, maintained regualary. New tim-ing/valve job/brakes. 209-481-4032

1981 - Toyota Corrola, 4dr sedan, silver, A/C, AT. 150Kmi. Reliable and fun to drive. $850 - $500 = $350 equivalent cost. 952-447-9509

1968 - Ford Torino GT. Body wrecked. Engine, trans and interior perfect. Great for parts. 209-825-6789

1991 - GMC Sonoma, 1800 obo 209-612-8926

1993 - CAMERO, V6, 5 speed, spectacular stereo system! Runs good, minimal body work. $3500 OBO 925-339-3999

1997 - SL-1 sedan, 108K miles, great shape, dark red, very clean, 1 owner,30+mpg, 5 speed. Comes with spike-spiders for snow driving. $2500/OBO 925-454-0943

1997 - Camaro Conv., 30TH Anniv. Edition, Silver 3.8 V-6, 5 spd., 12 disc CD, New shocks and struts, custom wheels. $8000 209-931-3239

2001 - Buick Regal, Fully Loaded, Immacu-late Condition, 9,000 miles, Always in Garage, $12,000 925-516-6885

1998 - Saturn SC2 Coupe New Mfg 3 yr, 36K miles warranty. Pearlize wht paint w/ spoiler, good condition, CD plyr, AC, pwr 925-447-4492

1996 - Pontiac Grand Am SE, 2 door coupe, 5 speed manual, 4 cyl, 106K mi, black, good condition, $3500 925-895-2266

AUTOMOBILE ACCESSORIES

13 inch TIRES. 2 Michelin 185/70/13 Radial tires, good condition only $20 both. Liver-more 925-447-7070

Chevy Alum. wheels, 6 lug for half ton PU. $100 bo 209-606-6445

4-Michelin Tires, 225/60/R16 with wheels from S-430 2001 Mercedes Benz almost new. You pick-up. All for $500.00 including the Mag-wheels. 925-426-0648

Roof rack rails for 1992 Plymoth Grand Voy-ager. $25. 925-706-2088

Four BF Goodrich LT285/75R16 agressive off, road tires mounted on bright alloy wheels. Toyota Tundra bolt pattern. About 80% tread remains. Offer 408-897-3313

Four, 20 x 8.5 inch Motto MT100 rims, mounted with Eagle GT II P285/50R-20 tires. Fits 6 lug, Chevy/GMC trucks. Asking $1,500. 209-832-5549

BMW Parting out, 1984 325E, Engine & 5 spd., 116,000 miles, $800.00, other misc. parts. 209-943-2166

Camper shell fiberglass fits 1998 ford 1/2 ton insulated rear light tinted windows nice 500.00 209-531-1330

Snug-Top Camper Shell; Ford or equiv, 8 ft. long bed, slider window, metallic gray color.$250 925-443-8869

BICYCLES

Womens bicycle, gel seat cover. $35/obo 209-403-4942

VW 1600cc Dual Port. 800 miles on 3-yr old rebuilt from Buggy House, 3031 PICT carb., heater boxes in tack. Exhaust with chrome tips. $800. 925-447-6321

2 seater child bicycle trailer - $100/obo - our chil-dren are riding their own bikes now 925-449-4646

BOATS

Boat trailer, large wheels $200.00 209-835-2781

Boat top. Snaps to top of windshield then back half is supported by aluminum frame. All includ-ed. $75 209-606-6445

1986 19ft Chris Craft, great family ski boat, am/fm/cd, low hours, excellent condition. Must see, $6,800 OBO. 925-525-3578

CAMERAS

Rollei TLR Model DBP DBGM W/Schneider Xenotar 80/2.8 lens and filters. Rollei Leather case extras. $550/offer 925-443-9599

Two old Polaroid Land Cameras, SX-70, and Model 95, In good working condition.could be antiques. $50.-both OBO. Call evenings 925-449-1718

ELECTRONIC EQUIPMENT

Macintosh imac, graphite color, 600 MHz, 256 MB SDRAM, 40 GB HD, CD-RW CD burner, soft-ware includes Microsoft Office. $600. Canon Scanner. $30. 925-846-3653

COMPAQ 1255 Laptop computer, 333MHz, 12 in TFT, 96 MB RAM, CD, Floppy, 3.2GB and 4.8GB HD, WIN98Me, Battery, charger, Good condition $150/OBO 925-447-2697

Lexmark Z25 & Canon S750 color inkjet printers, $30 each. Like new condition, have ink. Perfect for students or home office. 925-209-8880

Poineer 57 inch widescreen rear projection T.V. Picture in picture. Not HD compatible. $800.00. Model #SDP5795W. 54wx52hx25d. Five years old. 925-425-3373

GIVEAWAY

Gravel. Great for landscaping/ drainage projects. You haul.

925-485-4321Dishwasher, working when removed for upgrade,needs door spring and lower panel. You pick up from Castro Valley. 510-886-4610

Boys bmx bike, needs rear tire tube, rear brake cable. 925-516-6379

Free Kitchen Aid dishwasher, you haul away. Porcelain interior with adjustable racks 925-447-3036

Free sailing gear includes float coat, harness, new gloves. 925-606-5808

Ceiling Fans, 2 each, 4 blade, antique brass, one flush mount, one drop-down mount. 925-961-1658

double basin cast iron sink, almond color, tile-in style. Good condition. Call before 9PM please. 925-449-7009

Servicable items from grad school: Sofa bed couch unfolds to double bed; desk ñ metal stand, wood top, approximately 2.5í x 3.5í. 925-361-9254

HOUSEHOLD

Shelving, 1 metal 4 shelf unit, $5, 1 Williams Sonoma open pine 6 shelf, $20 both in good shape, call for sizes, you pick up. 925-245-9648

30 inch Kenmore ELECTRIC STOVE- white, self cleaning, digital clock.One burner weak $30 OBO 925-447-7070

Large wooden play structure w/ two 5x5 ft towers, swings, needs some assembly & work, $200 obo. 925-294-9022

Mirror with oak frame, 34x44, excellent con-dition. Nice for living room, entry, etc. $25.00. 925-455-5985

Twin Bunk Beds. Beautiful Condition, Wood & Wrought Iron. $50.00 209-892-2369

Free Queen size mattress. Good condition 925-443-5008

Remodeling - Kenmore ceramic top stove, almond, only 3 years old in great condition. $250.00 925-443-9110

Oak Kitchen Table with 4 chairs $200.00 Microwave, Self Cleaning Oven, Dishwasher $50.00 each and Jenn Air 4 burner cooktop $40.00 925-462-0564

Antique Yellow Oak china cabinet, 51in w x 15in d x 6ft6in tall. $100 925-447-9355

Color TV, 21 inch Proscan with remote and matching black wood shelved TV stand. Excellent condition. $150. 925-648-0671

Appliances built in DISHWASHER, used working condition, $30, FREEZER 14 cf, manual, $50. REFER 15 cf freezer on top $150 OBO 209-606-6445

4 ladder-back oak chairs and farm table, 32x54 inches. Chairs in excellent condition & very com-fortable: $99 for all 4 plus table for free. 925-606-5334

SECTIONAL - Large two piece sectional, in good condition. Located in Tracy, can provide pictures through email. $300 obo 209-835-6556

Nice bookcase, medium tone, 9 feet tall, cup-boards on bottom with 33/72 inches, 3 shelves $80 925-449-1823

Oak desk, 5 drawer, 2 file drawers $100, over-stuffed striped chair $75 925-606-5808

Wall unit, oak pattern, solid, good condition. Fits 23in. TV, shelves, doors. $59, OBO. 925-447-9509

Sofa and big matching chair $499, elegant, deco design, black with tan swirl fabric, reduced price 925-382-4478

Moving Sale-sofa, dressers, twin matress sets, queen platform/bedroom set, glass dining table, & more.No reasonable offer refused. 209-479-0693

Crib, mattress & bedding; excellent condition; converts to toddler bed; $80 925-924-0286

Garage Sale - August 21-22 8 a.m. - 4 p.m. 1735 Dawn Street, Livermore. Lots s of Stuff Must go! 925-454-1439

Solid oak dining table (42X72) with 6 matching chairs, plus extra leaf. $300.00 or BO. 925-443-7422

Electric Lawn Mower - $75/obo - barely used lawn mower - we no longer need it because we paved over our last remaining grass. 925-449-4646

Sheet and pillowcase set, queen-size, almond color, 100% Egyptian cotton, new, in original packaging, fits up to 20-inch mattress, $25. 925-447-5623

Oval dining/kitchen table, seats four very comfort-ably, can accommodate six, painted bright Mexi-can colors, very cheery. $50 925-455-0998

MISCELLANEOUS

TOOLS. Full compliment journeyman level auto and autobody repair in Craftsman toolbox. Value $10K. Asking $5K OBO. 209-575-0565

Draftsman table, with adjustable base, sliding straight edge and paper holder, this is an older piece with character! $40 925-245-9648

CARDBOARD BOXES, for moving/storage: 40 for $50 925-447-7070

Proform 650 Cardiocross elliptical trainer, w/ arm workout, great condition, $175. USB to cell phone charger cord, Motorola, new, $10. 925-294-9022

Avent Sterilizing Bottle System With Many Bottles & Tippy Cups. Great Condition! $50.00 , hand held electrical brest-pump by evenflow. only used for 1 week! 25.00 209-892-2369

Black and Decker 7 1/4 inch circular saw. $25. 925-648-0671

ANTIQUE ARMOIURS OAK 3 to choose from. Each one is 4 ft. wide. $350 each. Also antique oak secratary 209-606-6445

Need SF vs Miami tickets for 11/28 on Miami sideline with good seat viewing. Willing to pay face value or will pay slightly more for each tick-et. 209-814-3556

Clothes dryer, new, apartment size, 120 Volt, white, perfect condition, can deliver. Cost $200, sell for $39. Come see it! 925-447-9509

Giants tickets for Friday August 20 and Sunday September 19. Two tickets for each game. Great seats! Sell for face value of $29.00 each. 925-454-1439

Troy-Bilt Riding Mower. 42in cutting deck. Two years old. Runs great. Too big for my new yard. You pick up, in Tracy. Best offer. 256-337-1983

CLEAN FILL DIRT - FREE, We load, you haul. 209-239-1338

Top Freezer Refrigerator, Maytag Plus, white, 21cu. ft., 69 x 35 x 33 in. deep, elevator shelf, factory-installed ice maker, like new. $600 925-455-0998

MOTORCYCLES

2003 - Vego SX600 Electric Scooter, with seat, bike lanes in town and on site: O.K., $300 - 925-449-5466

2004 - Polini X1 Works, 50cc liquid cooled race bike, perfect cond. Hardly ridden many extras asking $2,600 obo. 925-354-6431

1972 - Honda Trail 70 very good condition great for camping or kids runs great lots of fun $1,000 209-531-1330

MUSIC INSTRUMENTS

Roland MP300 digital piano. 3 yrs old. Excellent cond. $1600 obo. 925-443-1535

Upright piano for sell. Moving, must sell. Will accept reasonable offer. Great for beginner, needs tuning. 35 y/o Balwin. 925-449-4421

Baby Grand Piano Storey & Clark $1500 925-449-4624

100 Watt Carvin tube amp 2x12 w/pedal for DIST & clean. Good condition - $300. 925-606-6422

Takamine Classical Guitar Model C132S. with hard case. Solid Top and Excellent Tone. Retail for $899.50. Sell for $495.00 209-484-0058

Grand piano, 1984 Young Chang G-185 (6 ft., 1 in.) with matching bench and a free tuning by my tuner. Polished walnut. Excellent condition. $6,000. 925-447-4352

Piano, English Upright, circa 1885, Burled Wal-nut Cabinet, Carved legs,Ivory Keys. $350.00 209-943-2166

PETS & SUPPLIES

Rabbits, several breeds for show or pets, prices vary. 925-706-2088

Pixie-Bob kittens, one male, one female. Call for details. Ready 9-1-04 209-835-4281

PUPPIES and KITTIES! For pictures call (209)832-7709. For adoption information call: 925-381-5262

RECREATION EQUIPMENT

Sparring gear, one adult set, one child set, like new. $25 each. 925-706-2088

Reloading Equipment; misc, scales, powder mea-sure, presses, older equipment, but still works. Call for more info or I can email list. 209-833-5033

$40or BO Baby Jogger with rain shield, excellent shape; $35 or BO baby/child backpack with rain shield, excellent shape 925-828-2451

Taylor Made Driver and 3 Wood Super steel 10.5 regular flex - both graphite. Excellent cond. $50 each 925-443-6603

RIDESHARING

Express your commute, call 2-RIDE for more information or visit http://www-r.llnl.gov/tsmp.

BERKELEY - Rider-driver needed to complete a four person carpool. Leaves north Berkeley at 7 am; leaves LLNL at 4:40 pm. 510-524-8332, ext. 2-5949

Modesto Dennys on Salida Blvd at Pelandale and Hwy 99 - Daves Luxury vanpool, captain seats, reading lights cellphone 8-4:45 ridership-based fares, 209-576-7764, ext. 3-3194

Cupertino Area - Looking to join a carpool as a rider/driver. AWS M-Th 7:15am-5:00pm, Fri 7:15am-4:00pm. 408-438-1784, ext. 4-4527

LIVERMORE - Seeking a ride from So. Livermore Ave. in front of new Livermore Library, to Lab. Will pay accordingly for your service. Call for more info, 925-449-1718, ext. 2-7448

San Jose /West - Looking to join a carpool as a rider/driver. 9/80, off Friday. Non-Smoking. 408-268-7924, ext. 2-9107

Stockton - Fourth driver/passenger needed for car-pool from Stockton to the lab. Alternate 9-80 work schedule 7:00 to 4:45. 209-957-4765, ext. 3-5468

Orinda - Lamorinda carpool seeks 4th rider/driver. Lab hours 8am-4:45pm. Meets near St. Stephens and Hghwy 24. 925-253-0498, ext. 2-9823

El Cerrito Area - Looking to join a carpool as a rider/driver, 7am-4pm, 5/80 schedule. 510-559-7850, ext. 2-3987

PATTERSON - Don't commute alone; Ride The Vanpool, save $$ and wear/tear on your vehicle, get R&R + commuter benefits. Ridership based fares. 209-892-2118, ext. 2-9502

SERVICES

Piano lessons-Livermore. Beginning students, all ages are welcome. $15 per half hour les-son. Limited avail. 925-321-3004

SUPPORT GROUP for BETTER RELATION-SHIPS-personal/business! Codependents Anonymous (CoDA) Meets Tuesdays Noon T3520/R1174 Just come or call for Info 925-447-7070

Springtown mom has daycare openings for your 1-2 children to age 5. Refs avail, gated home/play yard loving environment, low rates. 925-447-0887

Looking for a handyman to replace faucets in my home. 925-447-1428

SHARED HOUSING

Livermore - Share 2 bedroom, 1 bath, 2 car garage home with one other person. Recently repainted and well maintained. $600 plus half utilities. 925-828-4384

Livermore - Livermore Fem,$500/Mo,Mas-terbedroom,1year Lse. 925-447-2466

West side of Livermore, - room for rent in newly remodeled house: $ 650 a month plus utilities, nonsmoker, nice and quite neighbor-hood. 510-566-4156

Room for rent in San Ramon. Share a 2+2 apartment with one single woman (42) , her dog and cat. Monthly rent will be $600 + 1/2 utilities. 925-783-1131

TRUCKS & TRAILERS

1978 - Dodge D150 1/2+ Ton Full Size Long Bed 6 cyc, 4 spd, camper shell, 96K original miles, runs good, smogs, new alt, fair condi-tion $1200/OBO 925-447-2697

1998 - Clean-just smogged. Std cab, good on gas. Extras include CD, headers, intake, exhaust, rims, tint, lowered, etc. 71,000 miles. $7800 925-373-9128

1989 - MITS Mighty Max, five speed, A/C and Shell. 214,000 miles, did not pass smog, only $1000K. 925-321-2753

1997 - Ford Starflyte RV. 21 foot, self con-tained. Low miles, like new. 530-994-3626

1994 - AVION 32ft, 5th WHL. Excel. condi-tion. 13ft Slide Out, central air, 2TVs Must see. $17,900 925-686-1197

2003 - 26ft Salem front bedroom, bunk beds, 6ft slide out, ac, includes hitch. 16,000.00. obo. 209-522-9630

1991 - Chevy Stepside pick-up shell. Fits 91-? Sliding front window, maroon in color Good shape. In storage for last 7 yrs. $100.00 209-321-7203

VACATION RENTALS

Soda Springs/Donner Summit, Charming Classic A frame, 2BR/1BA+Loft, sleeps 8, conv to biking, hiking, everything. Swimming & Kayaking 1/4 mile. 209-836-3481

SOUTH LAKE TAHOE - 3 Bedroom 2 Bath Chalet, comfortably furnished, all ameni-ties,Escape to Tahoe!! RESERVE NOW! 209-599-4644

Solana Beach/Del Mar - Oceanfront condo, deluxe 2 br., 2 1/2 ba., fully equiped, tennis, pools jacuzzis, gated and covered parking, near San Diego attractions 925-443-2271

Maui, HI - Kahana Reef oceanfront 1BR/1BA condominium. Beautiful two-island view, oceanside pool, and BBQs. LLNL rates for year-round reservations. 925-449-0761

WANTED

Used soil vibration compactor, plate type, gas or elect. at reasonable price 510-538-7444

SORRY-If you called me- interested in sitting for 2 Cavaliers,10/5-10/16 - please call again I have lost telephone numbers 925-837-0863

43cm Road Bike for beginning younger rider. 925-294-8469

Our Savior Lutheran School needs a Math-Counts coach (junior high level). Meets once a week, 7:30-8:15, 10:30-11:15, or 3:15-4:00. 925-838-4150

Wanted-Set of Poker Chips, 11.5 gram clay only, call and leave message. 925-784-6191

Looking for a responsible high school student to help me with yard work on a regular basis. 925-454-3396

Old Vespa scooter wanted, running or not 925-449-0388

WANTED: Accident free & gently used BRITAX car seat. 925-516-1180

Wanted: Baby bassinet with wheels. 925-784-9661

Wanted: Cheap bicycle shoes and clipless pedals. 209-824-2177

Due to space limitations, *Newsline* may withhold ads that have already run. They will still appear on the Web.

CARBON

Continued from page 1

JACQUELINE MCBRIDE/NEWSLINE

Mark Evans and John Cooper examine a prototype fuel cell for carbon conversion in their lab.

nessed from the same amount of fuel, while cutting the amount of carbon dioxide produced per kilowatt almost in half.

"Direct carbon conversion has the potential to be the long-sought 'clean coal' technology," said chemist John Cooper, senior scientist in the Lab's Materials Science and Technology Division.

"Ninety percent of the Earth's electric energy comes from the burning of fossil fuels," Cooper said. "Coal constitutes half of our fossil-fuel resources, and 80 percent of the coal belongs to the United States, Canada, the former Soviet Union and China.

"Coal-fired plants produce 55 percent of U.S. electricity — as well as large amounts of pollutants. As a result, the vast energy reserves of coal remain underused."

The conversion efficiency of today's coal-fired power plants is between 35 percent and 40 percent. Direct carbon conversion, an electrochemical process that converts carbon particles obtained from different fossil fuels directly into electricity without the need for such traditional equipment as steam-reforming reactors, boilers and turbines, would be roughly twice as efficient as today's technologies.

Cooper said the LLNL method, the result of a four-year study funded by the Laboratory Directed Research and Development Program, would push the efficiency of using fossil fuels for generating electricity much closer to theoretical limits than ever before. It would also improve the environment by substantially decreasing the amount of pollutants emitted into the atmosphere per kilowatt-hour of electrical energy generated.

"Perhaps most important," he said, "it would reduce carbon dioxide emissions, which are largely responsible for global warming, by producing a pure carbon dioxide byproduct that could be sequestered or used in industry at no additional cost of separation or concentration."

Direct carbon conversion requires a unique kind of fuel cell. A fuel cell is an electrochemical device that efficiently converts a fuel's chemical energy directly to electrical energy without burning the fuel. However, instead of using gaseous fuels, as is typically done, the new technology uses particles of elemental carbon (or thermally decomposed fossil fuel molecules called "chars") whose atoms exhibit a high degree of structural disorder. These particles are wetted by a mixture of molten lithium-sodium-and-potassium carbonate at a temperature of 750 degrees Celsius to 800 degress Celsius. The materials react with carbon and oxygen from the ambient air to form carbon dioxide and electricity.

Cooper said the reaction yields 80 percent of the carbon–oxygen combustion energy as electricity. It provides about one kilowatt of power per square meter of cell surface area — a rate high enough for practical applications.

Direct carbon conversion can use fuel derived from many different sources, including coal, lignite, petroleum, natural gas and even biomass (peat, rice hulls or corn husks).

What's more, Cooper said, "the offgas is a source of valuable hydrogen gas, which has many uses in the hydrogen economy beyond its possible use in utility fuel cells."

The carbon–air fuel cell gives off a pure stream of carbon dioxide, which is only a fraction of current processes and can be captured without incurring additional costs of collection and separation from smokestack exhausts. The carbon dioxide can be sequestered in geological formations or the ocean, or used for oil and gas recovery through existing pipelines.

Cooper and his team have demonstrated the technology in a number of small, experimental cells with reaction areas of about three to 60 square centimeters. In repeated tests, the cells deliver up to one-tenth of a watt continuously per square centimeter and are 80 percent efficient at 100 milliwatts per square centimeter. Certain other more exotic (but more expensive) forms of carbon yield such efficiencies at nearly three times the rate. Cooper said the team has operated cells for days, simply by adding more carbon fuel.

The cell's fundamental thermodynamic properties mean almost no waste heat and full fuel consumption. In addition, cell components and fuel are nontoxic and relatively hazard-free. In particular, Cooper said, because the slurry does not explode if inadvertently brought into contact with air, "no explosion-prevention safeguards need to be engineered into the cells."

As it continues its research, the Livermore team's goal is to develop a simple fuel cell technology that greatly increases the yield of electric energy from each unit of fossil fuel, uses fuels derived efficiently from coal — the most abundant of all natural fuel resources — significantly decreases the carbon dioxide released into the atmosphere and makes it easy to capture the carbon dioxide for sequestration or other use.

BOOKLESS

Continued from page 1

environment via monitoring, compliance, restoration and waste management activities, and protecting the health of the employees.

"One of the Laboratory's core values has always been simultaneous excellence in science and technology, operations and business practices," Bookless said. "Without an excellent safety and environmental protection program, we could not accomplish much of the work we do. I look forward to helping the Lab build upon a strong program in these areas."

Bookless will be responsible for a budget of a $121 million and his organization has more than 700 employees.

Bookless said he was attracted by the diversity of talent in his directorate — an assembly of physicists, engineers, hazards control experts and technicians. "This is a different cut of the Lab," he said, adding his role will be not only leading his diverse crew, but also providing management "that can help all of you accomplish your role."

"Bill will be an outstanding leader," said Anastasio, adding that not only will he make the kind of decisions to help his directorate accomplish its missions, but help other organizations as well.

Bookless came to the Lab in 1978 to conduct his doctoral thesis research. Back then he was struck by the Lab's "remarkable teamwork" and depth of expertise, which he says has never waned. "It allows us to keep giving the country what it wants from us."

From 1981 to 1986, he served as project leader for investigating the effects of pulsed, high-current electron beams and investigating the effects of X-ray lasers. In 1986, he was named deputy leader of B Division. In 1988, he was named associate program leader in the nuclear test program; Bookless was appointed program leader of the Nuclear Weapons Surety (Safety, Security and Use Control Program) in 1991.

Since 1994 he has served as project leader of the Nuclear Weapons Information Project, an effort to determine the best way for the weapons program to capture the knowledge learned during the existence of the program and make this information available to future experts. "This will improve our stockpile stewardship prospects as we lose the individuals who were instrumental in the development of the current and projected stockpile," he said.

In 1996, Bookless was named deputy associate director of the Defense and Nuclear Technologies Directorate, providing assistance in the planning and execution of the nuclear weapons program.

Since 2002 he has also served as the N Program leader. N Program is responsible for all LLNL experiments and operations at the Nevada Test Site.

Bookless served as editor of the Laboratory' scientific magazine, *Science & Technology Review,* from 1994-95. He has published nine papers on various aspects of lasers and physics research and is a member of the scientific fraternity, Sigma Xi.

Bookless earned his bachelor's degree in physics from Southern Illinois University in 1975 and his Ph.D. in physics from the university of Wyoming in 1980. He is a resident of Livermore.

Following Bookless introduction to SEP employees, Anastasio also took time to thank Rex Beach, who served as acting associate director, and Manny Lateiner, the deputy associate director for SEP, for running the directorate following Fisher's departure.

Fire ecology has been a burning issue through the ages

LLNL's wild side

By Jim Woolett

Fire has been linked to the natural dynamics that historically have shaped plant communities and animal populations throughout California. Fire became a tool commonly used by early inhabitants of the state to promote: effective hunting for big game; improvements of the landscape for dwellings and cultural activities; and curtailment of pest and disease outbreaks.

Recent catastrophic, fire-related events across the state have drawn attention to "adequate fuel" (e.g., woody debris) reduction and management practices. Many federal and state institutions with land management responsibilities are studying new aspects of fire ecology as well as the history explaining how the flora communities and vegetation types currently found in the state established themselves.

Annual burning at Site 300 takes place to protect the area from potential out-of-control wildfires.

Prescribed fire treatment is a method of reducing hazardous natural fuels in an area and/or rejuvenating vegetation to reach a targeted, ecological result. For instance, fire may be used by an agency to regenerate timber stands in areas that have been previously logged and that require an environmental stimulant to promote restoration and reforestation of the land.

Prescribed burning is an annual landscape management procedure implemented at the Laboratory's Site 300 under carefully planned, permitted and monitored conditions. Specific buffer areas of grassland habitat are burned to protect site facilities from the hazards of wildfire during dry summer conditions. Consistent with the practice, these grassland habitats display healthy suites of native plants not visible in other areas of the property. Fire frequency in this region of California has historical precedent. Native wildlife species have developed particular adaptations to survive in these fire-driven ecosystems.

Evidence suggests that the native people of this region of California (the interior coastal region) substantially altered the early vegetation communities from patchy shrublands to grasslands through the use of routine, prescribed fires. Widespread chaparral shrublands are believed to have existed at this location in early times. In many cases, this chaparral formed dense, nearly impenetrable stands.

For native people, these stands represented an obstacle to food resources, made travel difficult, sheltered large predators such as grizzly bears and mountain lions, and consumed much of the surface spring water available. Incorporating fire into their lifestyle allowed these people to "farm" for seed-producing plants that responded to burned areas and subsequently yielded high quality food sources similar to an agricultural effort. Animals such as deer, quail and rabbits, which preferred the more open environment, were drawn to these areas, providing important food sources for local inhabitants.

Colonial Spanish missionaries who immigrated to California in the late 1700s are believed to have discovered an open landscape in the interior coastal range ripe for livestock and farming. With the release of European cattle, many of the plants that had occupied burned shrubland areas were taken over by non-native grasses introduced with the old world animals. These exotic grasses produce the "golden" hills that now typify California topography.

Many of California's wildlife species have adapted to avoid the hazards of the dry season when vegetation fuel levels are highest and most flammable. Ground-nesting birds typically nest early in the season when moisture is still present in plants close to the soil surface. Small mammals may "hibernate" or estivate during the summer in grassland or chaparral areas that have been burned and that lack adequate food. Larger, herbivorous mammals migrate to the high ground in the winter for succulent grasses and associate with lower, wetter climates in the summer. Many of the smaller, more prolific animal species live underground or shelter in rock outcrops, safe from the heat of a fire.

Fires have guided the adaptations present in California plant life and animal communities. Restoring fire cycles in some areas may help safeguard human life and property and sustain wildlife diversity in the interior coastal ecosystems far into the future.

Standing up for veterans

KEVIN MELISSARE

From left: Lab veterans Mike Silva, Chelle Clements and Dave Nisse make field coffee for breakfast during the annual East Bay Stand Down at Camp Parks in Dublin last week. The Lab veterans group provided labor and financial support for the event, which provides medical care, job placement services, housing referrals and legal services to homeless veterans. Clements said about 400 people participated in this year's four-day stand down, up from previous years.

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